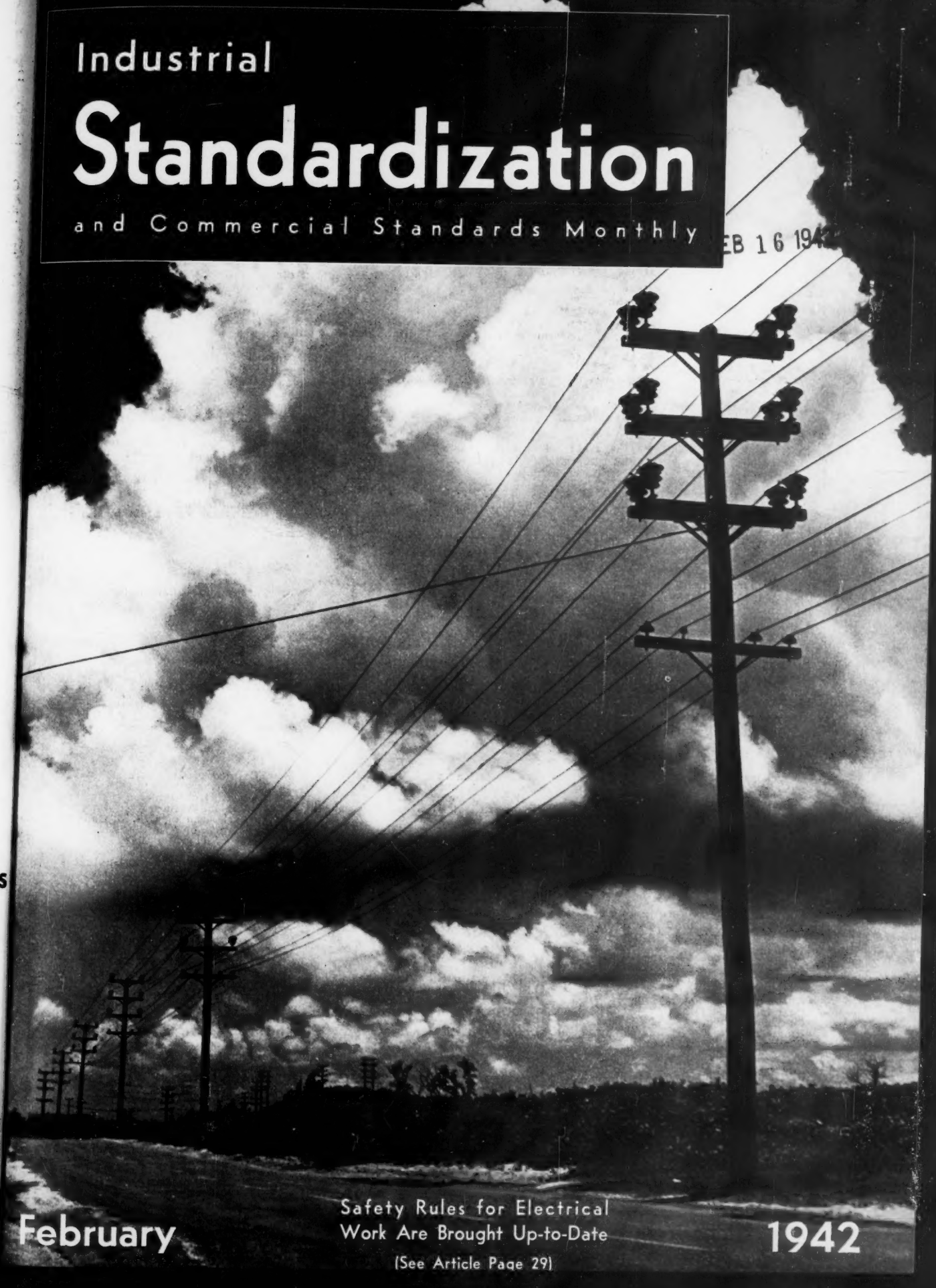
In Three Parts—Part 1

Industrial Standardization

and Commercial Standards Monthly



February

Safety Rules for Electrical Work Are Brought Up-to-Date

(See Article Page 29)

1942

American Standards Association

Officers

R. E. Zimmerman, President — Henry B. Bryans, Vice-President

P. G. Agnew, Secretary — Cyril Ainsworth, Assistant Secretary

Board of Directors

R. P. Anderson, secretary, Division of Refining, American Petroleum Institute, New York—Past-Chairman, ASA Standards Council

S. Bruce Black, president, Liberty Mutual Insurance Company, Boston, Mass.—National Association of Mutual Casualty Companies

Carl Breer, executive engineer, Chrysler Corporation, Detroit, Michigan—Automobile Manufacturers Association

Lyman J. Briggs, director, National Bureau of Standards, Washington, D. C.—U. S. Department of Commerce

Henry B. Bryans, executive vice-president, Philadelphia Electric Company, Philadelphia, Pa.—Electric Light and Power Group

G. S. Case, chairman of Board, Lamson and Sessions Company, Cleveland, Ohio—American Society of Mechanical Engineers

A. K. Chapman, vice-president and assistant general manager, Eastman Kodak Company, Rochester, N. Y.—Photographic Manufacturers Group

C. L. Collens, president, Reliance Electric & Engineering Company, Cleveland, Ohio—National Electrical Manufacturers Association

Howard Coonley, chairman of Board, Walworth Company, New York—Manufacturers Standardization Society of the Valve & Fittings Industry

Wm. F. Groene, vice-president, R. K. LeBlond Machine Tool Company, Cincinnati, Ohio—National Machine Tool Builders' Association

Pauline Beery Mack, director, Ellen H. Richards Institute, State College, Pa.—American Home Economics Association

H. S. Osborne, plant engineer, American Telephone & Telegraph Company, New York—Chairman, ASA Standards Council

J. Edgar Pew, vice-president, Sun Oil Company, Philadelphia—American Petroleum Institute

Edmund A. Prentis, Spencer, White & Prentis, Inc., New York—Past-President, American Standards Association

G. J. Ray, vice-president, Delaware, Lackawanna & Western Railroad Co., New York—Association of American Railroads

W. H. Sawyer, president, Peoples Transit Company, Dayton, Ohio—American Transit Association

Jerome Strauss, vice-president, Vanadium Corporation of America, New York—American Society for Testing Materials

R. E. Zimmerman, vice-president, U. S. Steel Corporation, New York—American Iron and Steel Institute

Standards Council

H. S. Osborne, plant engineer, American Telephone & Telegraph Company, New York, Chairman

A. W. Whitney, consulting director, National Conservation Bureau, New York, Vice-Chairman

Chairmen of Correlating Committees

Building—Rudolph P. Miller, Consulting Engineer, New York

Consumer—Irwin D. Wolf, vice-president, Kaufmann Department Stores, Inc., Pittsburgh, Pa.

Electrical—C. R. Harte, Connecticut Company, New Haven, Conn.

Highway Traffic—A. M. Wolf, Consulting Engineer, New York

Mechanical—Alfred Iddles, Babcock & Wilcox Co., New York

Mining—Dan Harrington, chief, Health & Safety Branch, U. S. Bureau of Mines, Washington, D. C.

Safety—Walter S. Paine, Aetna Casualty & Surety Co., Hartford, Conn.

ASA Member-Bodies

Am. Gas Assn
Am. Home Economics Assn
Am. Institute of Bolt, Nut & Rivet Mfrs
Am. Institute of Elec Engineers
Am. Institute of Steel Construction
Am. Iron & Steel Institute
Am. Petroleum Institute
Am. Soc of Civil Engineers
Am. Soc of Mechanical Engineers
Am. Soc for Testing Materials
Am. Soc of Tool Engineers
Am. Transit Assn
Am. Water Works Assn
Assn of American Railroads
Assn of Gas Appliance and Equipment Mfrs
Automobile Mfrs Assn
Cast Iron Pipe Research Assn
Copper & Brass Research Assn
Electric Light and Power Group:
  Assn of Edison Illuminating Companies
  Edison Electric Institute
Federal Housing Administration
Federal Works Agency
Fire Protection Group:
  Associated Factory Mutual Fire Insurance Companies
  Nat Bd of Fire Underwriters
  Nat Fire Protection Assn
  Underwriters' Laboratories, Inc
Institute of Radio Engineers
Mfrs Standardization Soc of the Valve and Fittings Industry
Nat Assn of Mutual Casualty Companies
Nat Conservation Bureau
Nat Electrical Mfrs Assn
Nat Machine Tool Builders' Assn
Nat Safety Council
Outdoor Advertising Assn of America, Inc
Photographic Mfrs Group:
  Agfa Ansco Division of General Aniline & Film Corporation
  Eastman Kodak Company
Soc of Automotive Engineers
Telephone Group:
  Bell Telephone System
U.S. Department of Agriculture
U.S. Department of Commerce
U.S. Department of the Interior
U.S. Department of Labor
U.S. Govt Printing Office
U.S. Navy Department
U.S. Treasury Department
U.S. War Department

Associate Members

Am. Assn of Textile Chemists and Colorists
Am. Automobile Assn
Am. Council of Commercial Laboratories
Am. Gear Mfrs Assn
Am. Hospital Assn
Am. Hotel Assn of U.S. & Canada
Am. Institute of Architects
Am. Soc of Heating & Ventilating Engineers
Am. Soc of Refrigerating Engineers
Am. Trucking Assns, Inc
Am. Welding Society
Anti-Friction Bearing Mfrs Assn, Inc
Assn of Iron and Steel Engineers
Associated General Contractors of America
Brick Mfrs Assn of New York
Grinding Wheel Mfrs Assn
Gypsum Assn
Heat Exchange Institute
Illuminating Engineering Society
Industrial Safety Equipment Assn
Insulation Board Institute
Internat Acetylene Assn
Metal Lath Mfrs Assn
Modular Service Assn
Nat Elevator Manufacturing Industry, Inc
Nat Lime Assn
Nat Retail Dry Goods Assn
Radio Mfrs Assn
Soc of Motion Picture Engineers
Structural Clay Products Institute
U.S. Machine Screw Service Bureau

Company Members—Some 2,000 industrial concerns hold membership either directly or by group arrangement through their respective trade associations.

Industrial
Standardization
And Commercial Standards Monthly

Published Monthly by
American Standards Association
29 West 39th Street, New York, N. Y.
with the cooperation of the National Bureau of Standards
RUTH E. MASON, Editor

Our Front Cover: Transmission line at Miami Beach, Fla. Photograph by Richard B. Hoit from Charles Phelps Cushing.

This Issue

PART 1

For Industry—

For Highway Traffic—

For Consumer and Retailer—

General News—

PART 2

PART 3

ASA

Reg. in U.S. Pat. Off.

Standardization is dynamic, not static. It means not to stand still, but to move forward together.

Subscription price $4.00 per year (foreign $5.00); Special to schools and libraries $2.00 (foreign $3.00); single copies 35 cents

February, 1942 Vol. 13, No. 2

Entered as Second Class Matter February 14, 1941, at the Post Office at New York, N. Y., under the Act of March 3, 1879.

Tools of the Safety Trade

"MOST of the ordinary equipment of a safety engineer can be classified in four groups," says Joseph E. Nichols in the December issue of *Safety*. The four groups referred to are: "Education, Experience, Ability to Influence People, and Standards."

It is only the last of these with which the American Standards Association is concerned—the some fifty American Safety Standards which Mr. Nichols estimated "have saved employees thousands of dollars in lost time and in compensation cases." These standards are the result of a pooling of experience on the part of industry, governmental groups, insurance, labor, and other interests. They represent the best known way of guarding a punch press or a grinding wheel, of protecting the eyes of a welder, or the health of an employee in electro-plating, or of guarding against 100 other hazards in industry.

Frequent revision keeps all of these safety standards in line with current practices, serving as a basis for progress in design, maintenance, and inspection. For instance, the National Electrical Safety Code, described on pages 29-32 of this issue, covers the safe construction and operation of electric lines and operation of electrical equipment. It was first written more than 20 years ago. Some section of it is almost constantly under revision.

These American Safety Standards are a rich source of experience and knowledge for the safety engineer. They are particularly important now, when the efficient operation of men and machines may mean the future of the country.

Safety Rules for Electrical Work Are Brought Up-to-Date

Fifth edition of National Electrical Safety Code is given approval by American Standards Association

by A. B. Campbell[1]

Secretary, ASA Committee on National Electrical Safety Code

WITH the recent completion of Part 2 of the National Electrical Safety Code, the Fifth Edition of the Code, started in 1937, has been completed. The Code outlines safety rules for the construction, maintenance, and operation of systems supplying electrical energy for light, heat, and power, as well as for communication and signal systems and radio installations. Former editions have been widely used as a guide to safe practices and have been accepted in whole or in part by many state regulatory authorities and by some municipalities.

In the Fifth Edition of the Code,[2] five parts have been approved by the American Standards Association:

Part 1. Safety Rules for the Installation and Maintenance of Electrical Supply Stations (C2.1-1941)
Approved as an American Standard May 8, 1941, and published by the National Bureau of Standards as Handbook H31.

Part 2. Safety Rules for the Installation and Maintenance of Electric Supply and Communication Lines (C2.2-1941)
Approved as American Standard August 27, 1941, and published as National Bureau of Standards Handbook H32.

Part 3. Safety Rules for the Installation and Maintenance of Electric Utilization Equipment (C2.3-1941)
Approved as American Standard May 8, 1941 and published as National Bureau of Standards Handbook H33.

Part 4. Safety Rules for the Operation of Electric Equipment and Lines (C2.4-1939)
Approved as American Standard August 10, 1939, and published as National Bureau of Standards Handbook H34.

Part 5. Safety Rules for Radio Installations (C2.5-1940)
Approved as American Standard May 29, 1940, and published as National Bureau of Standards Handbook H35.

A sixth part, Safety Rules for Electric Fences, is to be put into its final form by a separate sectional committee. It is expected that the text of Part 6, as approved by the sectional committee and published by the National Bureau of Standards as Handbook H36, will be included in the Fifth Edition of the Code as information. This will be done with the understanding that eventually it will be superseded by a new code developed by the new sectional committee C69 now being organized under the sponsorship of the National Bureau of Standards to deal specifically with this subject.

In the Fourth Edition of the Code there had been two separate sections in addition to the five parts. These were Section 1, including Definitions of Special Terms, and Section 9, Rules Covering Methods of Protective Grounding. In the new edition, the former Section 1 on Definitions is published in full in Part 2, but appropriate definitions are included in each part. The former Section 9 appears completely in Parts 1, 2, and 3—Handbooks H31, H32, and H33.

Section 1, as it appears in the Fifth Edition contains 18 new definitions. In so far as possible, all new definitions were made to agree with those in the new American Standard Definitions of Electrical Terms (C42-1941). A number of the new definitions, however, were made necessary due to changes in some of the rules in Part 2 and to the addition of the proposed new Part 6 on electric fences, which required definitions of terms that have not been defined previously.

The most extensive changes made in Section 9, which now appears in full as Section 9 of Parts 1, 2, and 3, were made to remove conflicts on grounding methods between these rules and those in the National Electrical Code. Since the Fourth Edition of the National Electrical Safety Code was completed in 1926 there have been several revisions of the National Electrical Code and as a result a few conflicting rules covering methods of protective grounding existed between these two codes.

One point sometimes overlooked is that Section 9 does not contain rules which specify where

[1] Edison Electric Institute, New York.

[2] The procedure and general outline of the method used in this revision has followed, in general, that described in an article on pages 193 and 194 of INDUSTRIAL STANDARDIZATION, July, 1937.

grounding must be done. The rules in this section, on the other hand, specify how grounding shall be done in situations where other parts of the code require grounding.

To those who have not had occasion to deal with or use the code in its previous editions the relation of Section 1 and Section 9 to other parts may not be clear. To help clarify this, it may be explained that these two sections contain material frequently referred to and used in other parts of the code. They might have been designated in the new edition as separate parts, or they might have been included as appendices. That they were not so treated is due to the fact that the present designation (Section 1 and Section 9) had been adopted in the earlier editions of the NESC. To change this designation would have caused confusion on the part of those who have been familiar with many of the NESC rules by the numbers which have always been related to the number of the part of the code in which the rules were contained.

Section 1 on Definitions and Section 9 on Grounding are both very important and their contents should be familiar to all who have occasion to use or administer the National Electrical Safety Code.

Organizations which helped in the revision of the National Electrical Safety Code are:

American Institute of Electrical Engineers
American Mutual Alliance
American Society of Safety Engineers—Engineering Section of the National Safety Council
American Transit Association
Association of American Railroads
Association of Edison Illuminating Companies
Edison Electric Institute
ASA Fire Protection Group: Associated Factory Mutual Fire Insurance Companies; National Board of Fire Underwriters; National Fire Protection Association; Underwriters' Laboratories
International Association of Electrical Inspectors
International Association of Governmental Labor Officials
International Association of Industrial Accident Boards and Commissions
International Brotherhood of Electrical Workers
National Association of Railroad and Utilities Commissioners
National Bureau of Casualty and Surety Underwriters
National Bureau of Standards
National Electrical Contractors' Association
National Electrical Manufacturers Association
National Municipal Signal Association
Public Service Commission of New York
Public Service Commission of Wisconsin
ASA Telephone Group: Bell Telephone System

Part 1—Safety Rules for the Installation and Maintenance of Electrical Supply Stations.

This contains rules which apply to the electric supply equipment of indoor and outdoor stations or substations. Provided the equipment is in separate rooms or enclosures, under control of properly qualified persons and accessible only to such persons, they also apply to similar equipment, including generators, motors, storage batteries, transformers, lightning arresters, etc., if installed in factories, mercantile establishments, vehicles, or elsewhere. Similar equipment under control of properly qualified persons, and accessible only to such persons, is excepted under the following conditions:

(*a*) If the voltage does not exceed 150 volts to ground.

(*b*) If the voltage is not more than 550 volts between conductors, and the power utilized does not exceed 3,200 watts.

The revisions made in this part of the code were due mainly to clarification and editorial changes, and such revisions as were necessary to make the rules consistent with developments and changes in electrical equipment that have taken place since the previous revision of the code.

Part 2—Safety Rules for the Installation and Maintenance of Electric Supply and Communication Lines.

The rules in this portion of the code apply to electric supply and communication lines in overhead and underground construction. They are not intended to be complete specifications but are intended to embody the minimum requirements which are most important from the standpoint of safety to employees and the public.

Probably as much time and effort was devoted to the revision of this part of the code as was given to all other parts combined and it was the last to be completed. Several important changes were made, among which were:

(*a*) A new method of specifying minimum clearances at crossings between supply and communication circuits and between supply conductors and railroad tracks, where increased clearances were considered necessary due to the length of spans;

(*b*) A revision of climatic loading assumptions and changes in the boundary lines between loading districts;

(*c*) New tension limits for supply conductors;

(*d*) A revision of the rule specifying insulation for supply-line conductors at crossings.

In addition to these changes, the three grades

of construction, namely A, B, and C appearing in the Fourth Edition for supply-line construction, were reduced to two grades; and the two grades of construction for communication lines, namely grades D and E, were reduced to one grade.

While changes were made in the climatic loading assumptions, this was done in such a way that the sag and tension charts for supply-line conductors made available by wire manufacturers during the past few years for use in connection with the Fourth Edition of the code may be continued without change as the assumed conductor loading remains unchanged so far as practical applications are concerned.

Also, in this part of the code, all references to voltage were made in such a way that it will be clear whether voltage between conductors or voltage to ground is intended. In this part of the code as in others, many changes of an editorial nature or which involved only minor changes in substance were made.

A change considered by some of considerable importance was the omission of all appendices in Part 2. After these are revised and made applicable to the Fifth Edition, they are to be included in a separate handbook along with material previously available in the volume known as Handbook No. 4, Discussion of the National Electrical Safety Code. This remains to be done but plans are now under consideration for it to go forward as rapidly as conditions will permit.

The five parts of the revised National Electrical Safety Code, approved by the ASA and published by the National Bureau of Standards, sponsor for the ASA project, are now available as follows:

Safety Rules for the Installation and Maintenance of Electrical Supply Stations Part 1 (C2.1-1941) 10¢

Safety Rules for the Installation and Maintenance of Electric Supply and Communication Lines Part 2 (C2.2-1941) 65¢

Safety Rules for the Installation and Maintenance of Electric Utilization Equipment Part 3 (C2.3-1941) 15¢

Safety Rules for the Operation of Electric Equipment and Lines Part 4 (C2.4-1939) 10¢

Safety Rules for Radio Installations Part 5 (C2.5-1940) 10¢

Members of the American Standards Association are entitled to 20 per cent discount on approved American Standards purchased through the ASA office.

The Proposed Safety Rules for Electric Fences are available from the Superintendent of Documents, Government Printing Office, Washington, D. C., at five cents per copy. A new sectional committee is being organized at the present time to prepare a new code for Electric Fences.

Part 3—Safety Rules for Installation and Maintenance of Electric Utilization Equipment

The rules in Part 3 apply to electric utilization equipment operating between 25 and 750 volts where accessible to other than qualified electrical operators, such as in mills, factories, mercantile establishments, hotels, theatres, and other public buildings; cars and other vehicles; dwellings, and similar places. It also contains rules applying to telephone and other communication apparatus on circuits exposed to supply lines or lightning.

This part of the Code is frequently referred to as the utilization rules in the National Electrical Safety Code. It touches on many situations that are also covered in the National Electrical Code. New material was added in the present edition for equipment used in open gravel pits and strip mining operations and for such situations as are likely to require safety rules for utilization equipment outside of buildings in rural districts. Considerable time was devoted to revising this part of the Code to remove all conflicts with the corresponding rules in the then current edition of the National Electrical Code so there would be no contradictory requirements between these two codes. Other changes were made to bring this part of the Code into conformity with modern practices and numerous changes of an editorial nature were also made.

Part 4—Safety Rules for the Operation of Electric Equipment and Lines

These rules apply to work on or about or the operation of the following equipment and lines when energized:

(*a*) Supply lines.

(*b*) Communication lines used in connection with supply lines.

(*c*) Electric equipment of central stations, substations, and private plants.

(*d*) Electrical tests.

(*e*) Electrical work in tunnel, subway, or similar underground structures.

Safety rules applying to commercial telephone and telegraph and other communication equipment and lines, with terminology adapted to the special needs of the employees concerned, are also included.

The revisions in this part of the code were not made by a separate technical committee as was the case with the revision of all the other parts.

but each technical committee was asked to suggest revisions for those rules in Part 4 with which it was directly concerned. For example, the Technical Committee on Part 1 recommended changes in the rules of Part 4 which concerned situations relating to Part 1. In addition to changes made in this way the sectional committee also made several changes not recommended by any of the technical committees.

Part 5—Safety Rules for Radio Installation

The rules in this section apply to radio transmitting and receiving installations, including antenna, counterpoise wires, lead-in conductors, grounding conductors, grounding connections, protective devices, and batteries. The rules do not apply to mobile or portable installations of any type, nor to equipment and coupling wires used for coupling carrier-current equipment to supply-line conductors. This revision consisted mainly in revising the rules to conform with the extensive development in radio transmitting and receiving equipment since the previous edition of the code was made.

Part 6—Safety Rules, for Electric Fences

While Part 6[3] was prepared by a special committee appointed to prepare safety rules for electric fences and contains a great deal of helpful information, it will eventually be replaced by a new code prepared by a separate sectional committee. It will ultimately be submitted to ASA for consideration as an American Standard.

In the meantime it is planned to include it as information in the Fifth Edition when all parts of the code are published in one volume.

SAE Manual to Unify Practice For Aircraft Engine Drawings

To help unify the practices of different aircraft-engine manufacturers, a manual of aircraft-engine drafting room practice has just been completed by the Society of Automotive Engineers.

"Up to now each engine and engine-accessory manufacturer has had his own manual," John A. C. Warner, secretary and general manager of the SAE, explained in announcing the publication. "However, because of the technical differences between these company manuals, the Government asked the Society to develop a standard manual which would make universal the language of design and manufacturing engineers."

The new manual consists of seven sections: (A) Preparation of Drawings; (B) Dimensioning by the Decimal System; (C) Standardized Parts; (D) Gears; (E) Thread Specifications; (F) Materials; (G) Miscellaneous—Abbreviations and Symbols for Use on Drawings.

Section A, which contains instructions on such matters as arrangement of views, lines and line work, sectional views, dimensioning, and lettering, has been written largely around the recommendations made in the American Standard for Drawings and Drafting Room Practice (Z14.1-1935). Of the two unit sizes for drawings recommended in the American Standard, 8½ by 11 in. and 9 by 12 in., the former size has been chosen in the SAE Manual as the one to be used.

Dimensioning by the decimal system is recommended in the Manual. This system, introduced several years ago by the Ford Motor Company, was described in INDUSTRIAL STANDARDIZATION in January, 1935.

Section D on Gears and Section E on Thread Specifications are still left blank in the Manual, the detailed data for these sections to be supplied later.

In Section F, Materials, it is recommended that sheet metal thicknesses be specified not by the gage number but by the high and low limit. The nominal value of the gage numbers in several gage systems is given in a table in the Manual, and it is recommended that the tolerance should be obtained from the Aeronautical Materials Specifications (AMS) in order to find the limits that apply in each case.

Section G gives a list of abbreviations and symbols for use on drawings, and also lists tolerances on drilled holes.

A committee of which J. G. Perrin, Pratt & Whitney Aircraft, was chairman prepared the Manual. Other members were: J. H. Carpenter, Lycoming Division, Aviation Manufacturing Corp; R. S. Kellogg, Packard Motor Car Company; C. R. Reynolds, Allison Division, General Motors Corp; Paul V. Richards, Wright Aeronautical Corp; and J. G. Schweiger, Ranger Aircraft Engines.

The Manual is being distributed in loose-leaf form. Copies are available at $1.50 from the Society of Automotive Engineers, 29 West 39 Street, New York.

---

[3] Part 6 has not been approved by the American Standards Association, and is included in the final document for information only.

Pan-American Highway Congress Promotes Standardization

Pan-American Conference uses American Standard Manual for traffic control devices; recommends standardization of road maps and road-condition symbols

by Robert E. Harper

Editor, Highway Information Service

SMOOTH flow of motor traffic across international borders will be facilitated through adoption of uniform traffic regulations by the nations of North, South, and Central America. The Fourth Pan-American Highway Congress, in co-operation with the Second Inter-American Travel Congress, meeting in Mexico City, September 15-24, 1941, drafted and submitted to the respective governments an Inter-American convention for the regulation of automotive traffic. Progress of construction of the Pan-American Highway, which will be dedicated on October 12, 1942, makes it increasingly important that rules governing the circulation of motor vehicles and their passage at and through common frontiers be standardized.

Standardization of road maps, road classifications, and road-condition symbols was another important step approved at the highway congress. Outlined in discussion were mapping requirements from the standpoint of convenience and accuracy. Size, drafting, editing, printing, and color were among the points considered. The road classifications — paved road, all-weather road, dry-weather road, and trails — were defined for mapping purposes to eliminate misunderstanding and confusion. The following road-condition symbols were selected as most suitable for use in Latin America:

Paved roads—a solid line of a minimum width of one millimeter;

All-weather roads—two parallel solid lines crossed by parallel lines not less than one millimeter apart;

Dry-weather roads—two parallel solid lines;

Trails—one broken line;

Roads under construction or improvement—two parallel broken lines;

Projected roads—continuous dots connecting the geographic fixed points;

Main bridges—the word "puente" followed by the name;

Ferries—the abbreviation "bal" (from the Spanish "balsadera").

Easy to Keep Up-to-Date

These symbols are progressive in character since, by the simple process of adding ink, a master map can be kept up-to-date and no basic changes are required on a printing plate. A trail or unimproved road can be converted into a dry-weather road, a dry-weather road to an all-weather road, and an all-weather road to a paved road by a stroke of the pen.

Road distances should be plainly stated in numerals, which should be drafted midway between fixed points and printed in the same color as the road line. The ends of the sections should be designated by arrows, asterisks, or other like symbols. Other conventional signs, especially those that intersect road lines, such as circles or modifications thereof indicating population, should be explained in the legend.

System Used by Public Roads Administration

The system of condition charts devised by the Pan-American Highway Confederation and used on its maps of the Pan-American Highway System was recommended. This system has been used by the United States Public Roads Administration and several foreign governments.

It was voted to standardize road symbols and markers on the basis of the Manual on Uniform Traffic Control Devices for Streets and Highways which was approved as an American Standard by the American Standards Association on November 7, 1935. The uniform vehicle code prepared by the National Conference on Street and Highway Safety served as the basis for laws now in effect in many Latin-American countries governing motor-vehicle ownership and operation.

Adopted by the travel congress was a uniform system for the compilation of statistics affecting

the tourist and travel trade. Standardization of highway statistics was also voted by the highway congress. Other resolutions concerned traffic regulations, uniformity of licensing requirements, reporting and recording of accident statistics, and uniform rules for vehicle inspection.

International co-operation was insured by establishment of an Inter-American Federation of Automobile Clubs, with headquarters in Buenos Aires, Argentina.

American Hotel Association Becomes ASA Member

As part of a new long-range program to help its members buy the things suited to their needs, economically, the American Hotel Association of the United States and Canada has become an Associate Member of the American Standards Association. As an Associate Member, the Association will make use of the large amount of research represented in American Standards. It expects to call on the ASA for help in the preparation of additional standards by which its 6,000 hotel members can better estimate the possible performance, use, and characteristics of the many products which they utilize in hotel operation.

In order to make full use of its new membership, the American Hotel Association has appointed John Burg as its contact man with the American Standards Association, and as its representative on standards and standards problems. Mr. Burg is vice-president in charge of personnel and front office operation of the Hotels Statler Company. He has had long experience in preparing standards for forms and methods of operation now in general use in hotels.

The AHA is planning a program of laboratory tests on some 50 items, ranging from china through carpets and rugs, in compliance with specifications approved by the association to be carried out by independent testing laboratories designated by it. The Association hopes that its recommendations on the basis of performance, use, and laboratory tests will save large sums of money for hotel men. Mrs. Grace H. Woolley, manager of the National Membership Division, is in charge of the program and A. G. Mezerik, of the Institute of Standards, has been retained by the association as consultant.

With the American Hospital Association, the American Hotel Association has asked the ASA for a project to develop a standard for performance of commercial dish-washing machines, and one for dishwashing practice.

AGA Research Program Gives Data for Standards

As a result of its research program, carried out as a basis for the development of standards for gas-burning appliances, the American Gas Association has now published Bulletin No. 12, Principles of Gas Storage Water Heater Design for Maximum Hot Water Delivery, and Bulletin No. 14, Fundamentals of Automatic Flash Tube Lighter Design.

Bulletin No. 12 contains results of studies on gas water heaters completed since the publication of Bulletin No. 9, *Fundamentals of Domestic Gas Water Heating*. It differs from that bulletin in that it is confined to a single phase of water heater performance—the maximum delivery of hot water. In the present bulletin, results of studies on the effect of heat application on stratification or separation of hot water and cold water during heating periods, and the effectiveness of dip tube design and other methods of introducing cold water to storage vessels in accomplishing and maintaining separation of hot and cold water during draw periods, are recorded.

Bulletin No. 14, which covers automatic ignition of gas range top burners by means of flash tubes, represents the first attempt by any organization or individual to publish scientific information on this subject. Results obtained, and interpretations, are included in this bulletin.

The research carried out by the American Gas Association is used as the basis for the work of the ASA committee on Approval and Installation Requirements for Gas-Burning Appliances (Z21). The standards developed by this committee are used by the American Gas Association in testing gas-burning appliances to determine whether they meet approval requirements and are entitled to use the AGA Seal of Approval.

Copies of these bulletins, and others in the series, are available from the American Gas Association Testing Laboratories, 1032 East 62nd Street, Cleveland, Ohio.

Publish Screw Thread Standards For Use by Government Agencies

An up-to-date edition of the screw thread standards which are mandatory for use by government departments has just been published by the National Bureau of Standards as Handbook H28, *Screw Thread Standards for Federal Services*, 1942. The new book, which is a revised and enlarged edition of Handbook H25 published in 1940, was prepared by the Interdepartmental Screw Thread Committee, made up of representatives of the U.S. Departments of War, Navy, and Commerce, and four liasion representatives of the American Standards Association. These representatives, appointed to coordinate as far as possible the activities of the ISTC with those of ASA committees concerned with screw thread problems, are:

Earle Buckingham, secretary of ASA Committee B1 on Screw Threads

J. H. Edmonds, member of ASA Committee B18 on Rivet Proportions

A. M. Houser, member of ASA Committee B2 on Pipe Threads

Charles C. Winter, member of ASA Committee B1 on Screw Threads

The major part of the material covered by the new Handbook is based substantially on eleven American Standards:

Acme and other Translating Threads (B1.3-1941)
Bolts, Nuts, Machine Screws, and Threaded Parts (B1.1-1935)
Fire Hose Coupling Screw Thread (B2b-1925)
Hose Coupling Screw Threads (B33.1-1935)
Pipe Thread (proposed revision of B2-1919)
Rolled Threads for Screw Shells of Electric Sockets and Lamp Bases (C44-1931)
Round Unslotted Head Bolts (B18.5-1939)
Screw Thread Gages and Gaging (B1.2-1941)
Slotted Head Proportions, Machine Screws, Cap Screws and Wood Screws (B18c-1939)
Socket Set Screws and Socket Head Cap Screws (B18.3-1936)
Wrench-Head Bolts and Nuts and Wrench Openings (B18.2-1941)

The Handbook also contains sections dealing with items not covered by American Standards as follows:

(*a*) Aeronautical Screw Thread Series, including an extra-fine thread series. (This is the same as the SAE extra-fine thread series, but it includes additional sizes. These threads have the American Standard form of thread.)

(*b*) Screw threads of special diameters, pitches and lengths of engagement

(*c*) Gas cylinder valve outlet threads, and hose connections for welding and cutting torches (the threads specified for these connections belong to the American Standard Fine Thread Series, Class 3. In addition to the threads, dimensions essential to the interchangeability of parts, but not covered by an American Standard are given.)

For Use in Complete Specifications

The specifications for threaded products and gages included in the Handbook are intended to embody sufficient information to permit the writing of definite and complete specifications for the purchase of screw-thread products.

Five Appendices give supplementary information of both a general and technical nature including specifications which are not intended to be mandatory. They deal with the derivation of tolerances; wire methods of measurement of pitch diameter; control of accuracy of thread elements in the production of threaded product; Class 5 fit for threaded studs (tentative specifications); and common practice as to thread series and class of fit for screws, bolts, and nuts.

The use of the standards given in the Handbook is mandatory in the U. S. Departments of War, Navy, and Commerce, "except where a need for deviation therefrom is shown."

Copies are available from the U. S. Government Printing Office, Washington, D. C., at 35 cents each.

Government Trains Engineers To Protect Industrial Workers

Courses for the training of safety engineers, to help prevent accidents and other health hazards which tend to slow up production in defense industries, are now being offered in colleges and universities throughout the United States. The courses are sponsored by the United States Office of Education and the United States Department of Labor through its National Committee for the Conservation of Manpower in Defense Industries.

A selected list of American Standard safety standards as well as other publications on safety are required material for the courses.

Approximately 11,000 students, many of whom are already employed in defense industries, are enrolled in the classes.

Two New Members Are Elected To ASA Board of Directors

TWO new members of the Board of Directors of the American Standards Association took office January 1, 1942—Pauline Beery Mack, director of the Ellen H. Richards Institute, State College, Pa., and W. H. Sawyer, Executive Engineer, New York. The American Home Economics Association, which has never before had a representative on the ASA Board of Directors, nominated Dr. Mack. Mr. Sawyer was nominated by the American Transit Association, to complete the unexpired term of H. P. Charlesworth. Mr. Charlesworth, who had represented the ASA Telephone Group on the Board of Directors, retired from active service in the fall of 1941 and the Telephone Group decided not to name a succesor. The Board of Directors selected the American Transit Association to replace the Telephone Group, for the remaining year of the term.

Other members of the Board of Directors were re-elected for three-year terms. They are:

Dr. L. J. Briggs, director, National Bureau of Standards, nominated by the U. S. Department of Commerce

C. L. Collens, president, Reliance Electric and Engineering Company, Cleveland, nominated by the National Electrical Manufacturers Association

Howard Coonley, chairman of the Board, Walworth Company, New York, nominated by the Manufacturers Standardization Society of the Valve and Fittings Industry

Dr. H. S. Osborne, plant engineer of the American Telephone and Telegraph Company, also becomes a member of the Board of Directors, ex officio, as new chairman of the Standards Council.

AHEA Active in ASA Work

The American Home Economics Association, although never before represented on the ASA Board of Directors, has been a member of the ASA Standards Council for some years and has taken a leading part in the ASA work on standards affecting the ultimate consumer. It is a member of the ASA Advisory Committee on Ultimate Consumer Goods.

Dr. Mack herself has been interested in specifications for consumer goods since 1923 when a research project in household chemistry carried on under her direction pointed to the need for specifications for the purchase of textile goods by large-scale buyers.

Dr. Mack was graduated from the University of Missouri with a B.A. degree in 1913, having majored in physical chemistry. She received her Master's degree from Columbia University in 1919 and her Ph.D. in biological chemistry and physics from Pennsylvania State College in 1932. She joined the faculty of Pennsylvania State College as instructor in Chemistry in the fall of 1919.

Dr. Mack a Specialist in Textiles

Dr. Mack has been particularly concerned with textiles and textile specifications and tests, through Fellowships sponsored by textile associations and set up under her direction, and studies carried out under her direction on the characteristics of textile fabrics related to dry cleaning and laundering and on the science of detergency. Under this program, standards have been worked out for evaluating the efficiency of the dry-cleaning process, and standard techniques for the measurement of laundry efficiencies have been developed in cooperation with the Pennsylvania Laundry-owners Association. "Test bundles"

Underwood & Underwood

Dr. Pauline Beery Mack

were used to measure soil removal, whiteness, color, strength, size and texture retention. In 1935 she inaugurated a program of mass studies in human nutrition, which was extended to include studies on the nutritional status of school children in representative Pennsylvania communities.

During Dr. Mack's teaching career the research program under her leadership had become centralized within three major fields—textiles and clothing, foods and nutrition, and shelter and household equipment. In 1941 the Board of Trustees of the College established the Ellen H. Richards Institute as a consolidated working unit to carry on research in the improvement of standards of living in these three fields. Dr. Mack is the first director of this Institute.

Dr. Mack is a Fellow of the American Association for the Advancement of Science, the American Institute of Chemists, and the Society for Research in Child Development. She is a member of the American Chemical Society, American Society for Testing Materials, American Association of Textile Chemists and Colorists, American Home Economics Association, American Academy of Political and Social Science, American Association of University Professors, American Association of University Women, and the Faraday Society of England. She is a member of the ASA Advisory Committee on Ultimate Consumer Goods.

Sawyer Nominated by ATA

Mr. Sawyer, newly elected member of the ASA Board of Directors nominated by the American Transit Association, was graduated from the University of Nebraska in 1894. He was employed by various street railway companies until 1895 when he joined the staff of the General Electric Company. In 1905 he left General Electric to work in the New York Office of the engineering firm of Ford, Bacon and Davis, where he stayed until 1914. From 1914-1922 he was vice-president of Clark & Company Management Corporation, Columbus, Ohio, and from 1919-1927 was president of the East St. Louis & Suburban Railway Company and affiliated companies. From that time until 1930 he was president of Stevens and Wood, Inc., and vice-president of the Allied Power & Light Corporation. In 1930 and 1931 he became co-receiver of the Atlantic Public Service Associates, Carolina-Georgia Service Company and Southern Public Service Company, and president of the Peoples Transit Company, Dayton, Ohio, which position he still holds. He has been consulting and executive engineer since 1930. In 1937-40 he was electric power consultant of the New York World's Fair.

In 1926 Mr. Sawyer was appointed by the Government of the State of Victoria, Australia, to investigate and report on the Yallourn brown coal electricity generation scheme and similar power undertakings of the State Electricity Commission of Victoria. In 1939-40 he carried out a transportation survey for the City of Bogota, Colombia, South America.

W. H. Sawyer

Mr. Sawyer is a Fellow of the American Institute of Electrical Engineers; and a member of the American Society of Mechanical Engineers and of the American Electric Railway Association. He was president of the AERA in 1926-27.

Australia Uses British Air Raid Standards

Work is now going forward in Australia to adapt the British Air Raid Precautions standards to Australian practice and to make use of materials available in Australia. Emergency lighting and obscuration materials are the first subjects to receive attention. Work has also been started on standards for camouflage paints. A standard range of colors similar to those adopted in Great Britain but adapted to suit Australian atmospheric conditions and landscape tones will be prepared. The need for safeguarding against detection by infra-red photography complicates the work of the committee.

Drinking Fountain Standard Gives Sanitation Data

THE American Standard Specifications for Drinking Fountains have now been brought up-to-date in a new edition approved by the American Standards Association and recommended to the ASA by the American Public Health Association. The revision was prepared mostly for the purpose of making certain changes in terminology in order to clarify the language.

The specifications, which were originally developed by the American Public Health Association and approved by the Women's Bureau of the United States Department of Labor, were recommended to the American Standards Association for approval by the ASA committee on industrial sanitation. The use of sanitary fountains, the committee pointed out, is one of the prerequisites for maintaining the health of industrial workers, and specifications for drinking fountains rightfully belong in the national program for industrial sanitation. The first edition of the standard was approved by the ASA in 1935.

Important requirements for sanitary drinking fountains given in the standard include:

1. The fountain should be constructed of impervious material, such as vitreous china, porcelain, enameled cast iron, other metals, or stoneware.

2. The jet of the fountain should issue from a nozzle of nonoxidizing, impervious material set at an angle from vertical such as to prevent the return of water in the jet to the orifice or orifices from whence the jet issues. The nozzle and every other opening in the water pipe or conductor leading to the nozzle should be above the edge of the bowl, so that such nozzle or opening will not be flooded in case a drain from the bowl of the fountain becomes clogged.

3. The end of the nozzle should be protected by nonoxidizing guards to prevent the mouth and nose of persons using the fountain from coming into contact with the nozzle. Guards should be so designed that the possibility of transmission of infection by touching the guards is reduced to a minimum.

4. The bowl of the fountain should be so designed and proportioned as to be free from corners which would be difficult to clean or which would collect dirt.

5. The drain from the fountain should not have a direct physical connection with a waste pipe, unless the drain is trapped.

With reapproval of the American Standard Specifications for Drinking Fountains in the revised edition, the American Standards Association again recommends the standard for use by employers and building owners and for adoption and enforcement by administrative authorities.

Copies of the specifications (Z4.2-1942) are available from the American Standards Association at 10 cents each.

NBS Handbook Describes Weights and Measures Work

Information about weights and measures and the work carried on by State and local regulatory officers, presented in understandable terms not only for the use of weights and measures officials but also for consumer groups and others interested, is now available in National Bureau of Standards Handbook H26. The book, *Weights and Measures Administration*, by Ralph W. Smith, presents a general discussion of weights and measures supervisory work. It describes the functions of State and local regulatory officials and tabulates the present organization of weights and measures administration in the United States. Part I also includes a model form of weights and measures organization, fee and licensing systems, essential elements of the law, and the training of officials.

Part II deals with those activities of an official which have to do with scales, weights and measures, and covers such subjects as standards and equipment, and the testing, adjustment, and repair of commercial equipment.

The supervisory side of weights and measures administration is discussed in Part III, which covers education of the users of commercial equipment and of the public, try-out inspections, investigation of complaints, and prosecutions.

Three appendices present the Federal weights and measures laws and regulations; the full texts of the three forms of the Model State Law on Weights and Measures; and a list of specific items of standards and equipment recommended for State and local departments of weights and measures.

Copies of Handbook H26 may be obtained from the Superintendent of Documents, Government Printing Office, Washington, D. C., at 75 cents each.

Lack of Standards as Trade Barrier Hinders U. S. Defense Effort

INTERSTATE trade barriers are hindering the defense effort, Paul T. Truitt, of the Department of Commerce, told the annual convention of the Mississippi Valley Association at St. Louis recently. He cited lack of uniform standards for sizes and weights of containers, as well as the variety of size and weight regulations placed on motor trucks by the states, as among the trade barriers hampering the free flow of goods in the defense effort.

Containers for fresh fruits and vegetables vary in weight by State law as much as 22 pounds to a bushel, he said. For example, the weight of a bushel of pears is 58 pounds in five states; 56 in two; 55 in one; 52 in one; 50 in four; 48 in four; 45 in 17; and as low as 36 pounds in one state.

There are 15 sizes of cantaloupe crates and seven sizes of apple boxes currently in use.

"Interstate trade barriers have been divided into two broad groups," Mr. Truitt explains, "those directly aimed at excluding non-local enterprise; and those which impose an indirect and heavier burden on interstate commerce because they are met again and again as commerce seeks to flow from one State to another State.

"Such restrictions have a cumulative effect amounting to an unbearable direct burden on interstate commerce, and one which is not imposed on local trade."

"For a generation we have been watching the States erect barriers," he declares. "We find ourselves heading backward toward a situation as damaging as that seen in Europe during the past two decades, when duties and customs barriers were erected every few miles across the channels of trade among the European nations.

"We should remember that those hampering, irritating barriers to trade, added to the old racial hatreds, had much to do with bringing on that tragic drama of human destruction, World War II, now endangering our existence."

Mr. Truitt suggests that every citizen should help to correct this situation by reporting specific trade-barrier cases to the Inter-departmental Committee on Interstate Trade Barriers, sponsored by the Department of Commerce in Washington; to the nearest Field Office of the Department of Commerce; or to the Council of State Governments, which has offices in Chicago.

Industry Is Reminded of Savings Through Standards

A reminder of the dollar savings for which standardization has been responsible in industry but which industry itself too frequently forgets or loses sight of, was given in an address by Earl W. Elhart, adviser to the Office of Price Administration, recently.

Speaking before the annual meeting of the American Home Economics Association Mr. Elhart recalled the publication on standardization of the National Industrial Conference Board, 1929, and cited the following examples reported in that document:

"One automobile company saved $4,000,000 as a result of the adoption of the same pattern for certain parts by a number of companies. The Bell Telephone System realized a saving of $50,000 a year on the purchase of $150,000 worth of black lead pencils which they attributed to standardization. The same company estimated that without the standardization of directory paper and the bulk purchasing which this enables, the same quality of paper would cost the Bell System about $800,000 more per year. The Western Maryland Railroad Company by standardizing their stationery and printing reduced the bill for these items from $110,000 to $65,000 per year. The State of New York reported a reduction of its printing bill, due to size standardization, of $450,000 a year. By standardization and the manufacture of interchangeable parts, the Remington Arms Company, Inc., reduced inventories 65 per cent and warehouse space 42 per cent."

Australia Studies Impact Tests for Steel

A series of comparative tests is being made by the Standards Association of Australia on local and imported steels to determine what type of impact tests should be included in Australian standards. Committees of the Association have had difficulty in deciding upon tests to be included in standard specifications because of the divergence of opinion in regard to the effectiveness of the impact test as a means of quality control, the SAA reports. The conflict of opinion is intensified because of a difference in practice in Great Britain and America.

AIEE Proposes Dual Rating Of Electrical Apparatus

by P. L. Alger[1]

Chairman, Coordinating Committee 4, AIEE Standards Committee

EVERY material or device, from a rubber band to a locomotive, has two independent physical limits, one of strength and one of endurance. The rubber band may support a large weight without rupture, but heat aging or oxygen exposure ultimately will reduce its strength to zero. So also, an induction motor operating at constant voltage has a definite torque limit at which breakdown occurs, but a much lower continuous torque-carrying ability, determined by heating and insulation aging effects.

To select a locomotive for a desired train-speed characteristic on a mountain railroad, or an electric motor for an elevator, or even a type of steel for the buckets of a steam turbine, both the strength and the endurance limits must be recognized and allowed for. When a system is built up of many different apparatus types, therefore, both strength and endurance limits must be properly matched. We cannot attain the perfection of the deacon who designed the "wonderful one-horse shay," but we can very profitably follow the principles he laid down:

> "Fur," said the Deacon, "It's mighty plain
> That the weakes' place mus' stan' the strain:
> 'N' the way to fix it, uz I maintain,
> Is only jest
> To make that place uz strong uz the rest."

For convenience in matching assorted materials or apparatus types, it is very desirable that the name-plate ratings indicate these two limits of strength and endurance separately. That is, a dual output rating is required for any material or apparatus to be used in short-time, intermittent, or varying duty. Examples of such dual ratings in common use are the proportional and fatigue strength limits of metals, the one hour and continuous ratings of railway motors, and the impulse and 60-cycle di-electric strength of insulation.

This problem of suitably describing apparatus for varying-duty service has been under study by an AIEE committee for the past two years. It is of particular importance to the electrical industry because electric motors and controls are now so widely used in association with every variety of mechanical equipment to perform the varied tasks of industry. Electrical engineers have found laymen generally to be singularly impervious to ideas about temperature rise and commutation limits of electric motors; therefore, it is natural that they have sought a more generally acceptable way of defining the output limitations.

The first results of this study have recently appeared in the form of a report, AIEE No. 1A. entitled "General Principles for Rating of Electrical Apparatus for Short-Time, Intermittent, or Varying Duty."[2] This report describes four distinct

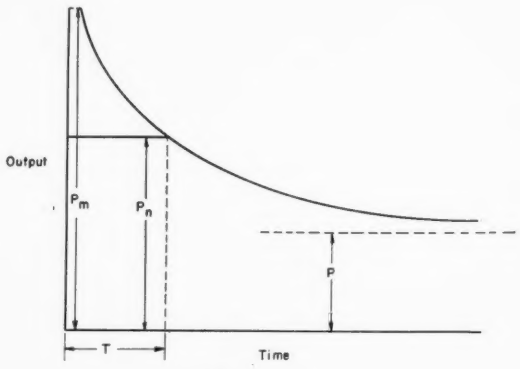


Figure 1.

Output-time curve of an electrical device

P_m = Maximum momentary output, fixed by other than thermal limitations

P = Continuous output, or rating for continuous operation under known service conditions

P_n = Name-plate rating, or sustained load that may be carried in intermittent, short-time, or other specified duty. In the case of general purpose apparatus, P_n may be slightly less than P, to provide a margin where service conditions are unknown

T = Time associated with short-time rating

$S = P/P_n$ = Service factor

[1] Mr. Alger is staff assistant to the vice-president in charge of engineering, General Electric Company, Schenectady, N. Y.

[2] Copies of this report can be obtained from the American Institute of Electrical Engineers, 29 West 39 Street, New York.

methods of rating such apparatus that are or have been frequently used, and proposes a new, or modified, "service factor rating" method for general adoption. This method is equally suitable for rating mechanical apparatus and materials, so that its use should facilitate the co-ordination of all the different elements in electromechanical systems of every sort.

The diagrams will assist in understanding the problem and its proposed solution. In Figure 1 is shown the output-time characteristic of an electric motor or other device. The maximum momentary load (P_m) that can be carried (say for one minute) is governed by the strength limit, fixed by breakdown torque, commutation, voltage regulation, or the proportional limit of the mechanical structure; and the endurance limit (P) is fixed by the temperature, chemical stability, and deterioration rates of the materials employed.

For any given type of apparatus, P_m and P may be independently varied over wide limits. For example, increasing the reactance of an electric motor or cable will reduce only its momentary load-carrying ability (for a given voltage), while heat insulating it will reduce only its continuous load-carrying ability (for a given insulation life). The curve equally well applies to a gas engine, a gear, or a steam turbine.

Obviously, the sustained load on the apparatus must be considerably less than P_m, and there must be a reasonable safety margin in addition to provide for unknown conditions of service. It is desirable, therefore, to choose a name-plate rating, P_n, representative of the load that is actually to be carried for repeated or sustained time intervals. Just how P_n is determined will depend on the type of apparatus and the service. It may represent a one-hour rating; or the average of a varying load over any agreed short time interval; or simply an arbitrary fraction of the required P_m value.

However, it is desirable to preserve an approximately fixed ratio of P_n to P_m for any given type of apparatus or system. For example, in the case of an induction motor, the stalled current being closely proportional to the breakdown torque P_m, a fixed ratio of P_n to P_m will make the P_n value alone a reliable indicator of all power-supply, fusing, and wiring requirements. A usual ratio of P_n to P_m for induction motors is 0.45 to 0.55, which assures ample torque margin for occasional operating peaks in excess of normal, and which corresponds to a stalled current of about five to six times the full-load value. As another example, in the case of arc-welding generators or transformers, the name-plate rating, P_n, may represent the actually expected welding current at maximum setting. This current is required only intermittently, over periods of a few minutes, as frequent idle periods are necessary for adjusting the work and replacing electrodes. The rms equivalent current over an extended period is rarely in excess of 80 per cent of the actual welding current, and so it is customary to use apparatus with a permissible continuous current materially less than the P_n value.

On this basis, therefore, the name-plate rating of any apparatus for short-time, intermittent, or varying duty ought to define the values of both P_n and P. The remaining question is whether to give both P_n and P directly, or the ratio P_n to P (greater than unity), or the ratio P to P_n (less than unity).

If both P_n and P are given directly, as in the case of the one-hour and continuous horsepower ratings of a locomotive, for example, it becomes necessary always to say which kind of horsepower is intended. It is as confusing as if coal weights

The proposed new standard method of rating electrical apparatus to show both its strength and endurance qualities, discussed here by Mr. Alger, will be of special interest to ASA Members because it opens the way for more economical use of vital defense materials during the present emergency. The method suggests that the continuous capacity of short-time rated apparatus be indicated on the nameplate by a service factor less than unity. In this way, smaller sized equipment, having adequate torque or strength margins, normally used in intermittent service may be applied more generally, while still preserving adequate life expectancy.

The new method was prepared by a committee of the American Institute of Electrical Engineers, of which Mr. Alger is chairman, and has been published by the Institute for study and comment. It is a "service factor rating" method which may be applied to mechanical apparatus and also to materials, and which facilitates matching strength and endurance qualities in all elements of electromechanical systems.

The article represents the substance of an address by Mr. Alger before the South West District meeting of the American Institute of Electrical Engineers, St. Louis, Mo., in October, 1941. It was discussed in "Letters to the Editor", published in the January, 1942 issue of *Electrical Engineering*, and was further considered at a conference during the Winter Convention of the AIEE on January 27.

were measured in both long and short tons, with the ratio of a long to a short ton varying under different conditions.

Comparison of an electric with a Diesel-electric locomotive, both having the same continuous rating of 4,600 horsepower affords an excellent illustration of this difficulty. The Diesel-electric, having no external source from which to draw power, can deliver 4,600 horsepower continuously, but cannot exceed this output even momentarily. The electric locomotive, being able to draw far more than continuous rated current from the trolley wire, can deliver far more than its continuous rated horsepower for short periods, within the thermal limits of the apparatus, as shown by Figure 2. In the case illustrated, the electric locomotive has a peak capacity of 8,800 horsepower and can deliver 7,000 horsepower for a considerable period, so enabling speed to be maintained on upgrades. It is not fair, therefore, to call them both 4,600-horsepower locomotives,

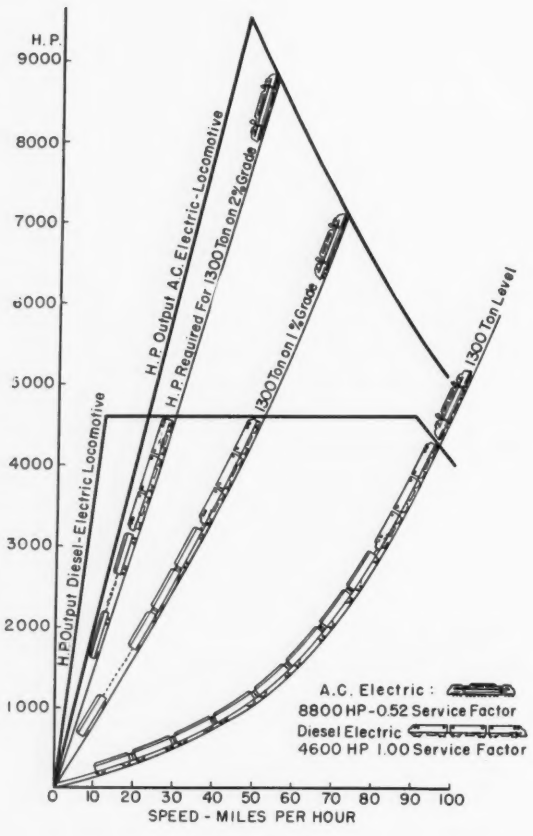


Figure 2

Horsepower Speed Curves and Performance of A-C Electric and Diesel-Electric 4600 Hp Continuous Rated Locomotives with Train to Give 1300 Ton Total Weight

nor is one a 4,600- and the other an 8,800-horsepower unit. They must be compared on a dual-rating basis.

If the continuous rating, P, is taken as the basic value, and the greater-than-unity ratio, P_n/P, is used to indicate the permissible operating load, another sort of confusion arises. Consider the case of a normal open-ventilated motor, with a continuous rating of 100 horsepower, for example. If the ventilation is shut off completely, the motor may become dangerously hot even at no load, and its continuous rating will be reduced to a small fraction of 100 horsepower. Yet, physically, and so far as stalled current, momentary power demand, breakdown torque, and short-time load-carrying ability are concerned, the motor is still a 100 horsepower unit. Conversely, by providing forced ventilation, the permissible continuous rating may be appreciably increased, but the torque limitations and power-demand characteristics will be unchanged. Hence, the continuous rating is greatly affected by ventilation, but is not a good index of physical size, cost, torque ability, or power-supply requirements.

The situation is as if a hoist were designed to lift a ten-ton weight once every ten minutes. Shall this be called a one-ton hoist, because it does the same average amount of work as another hoist lifting a one-ton weight through the same distance once each minute? Certainly the ten-ton lifting capacity requires greater size, stronger foundations, and has a greater cost, than the one-ton lifting capacity. It is, therefore, unreasonable to give them the same name-plate rating.

Permissible Operating Load and Permissible Continuous Load Both Needed

There remains the plan of taking the permissible operating load, P_n, as the basic, or name-plate rating, and designating the permissible continuous load by a factor less than unity. As already indicated, with a reasonably uniform ratio of peak output capacity, P_m, to the operating load, P_n, the latter figure gives a fair measure of the physical size, power demand, and basic cost of the apparatus. To give the two hoists of the preceding paragraph ratings of ten tons, 10 per cent time on, and one ton, 100 per cent time on, respectively, is altogether natural and understandable to the layman. This, therefore, is the recommendation made in the AIEE Standards Report No. 1A.

For convenience, and exact expression, the name "service factor" has been given to this ratio, P/P_n, of the permissible continuous load to the normal operating load. The term "service factor" bears a close analogy to the familiar term "load factor," which expresses the ratio of the average to the peak power demand of any system. In each case, a low service factor, or a low load

factor, implies a large physical plant and high stand-by charges, compared with a system having a high service factor or load factor and the same annual power consumption. Also, a low service factor, or a low load factor, implies a high ratio of peak-load-carrying ability to continuous capacity.

Recommendations

The recommendations of this AIEE committee report may be summarized, in a few brief statements; for all short-time, intermittent, or varying-duty apparatus (referring to figure 1):

1. The name-plate rating, P_n, should indicate the permissible frequently repeated or sustained load.
2. The momentary peak-load capacity P_m, should bear an approximately constant relation to P_n, for any given type of apparatus, in associated system elements.
3. The permissible continuous load that may be carried for an indefinitely long period without injury, P, should be indicated by a service factor, S, less than unity, applied to the name-plate rating: $P = SP_n$.

To put these suggestions to practical use, and adopt or modify them for industry standards of rating, is a task for the future that will take considerable time. One way in which they can be used to advantage with little delay, however, is by the addition of a less than unity service factor to the nameplate rating of all apparatus now having a short-time rating. This service factor will show the safe continuous load on the apparatus. Taking the torque or strength value indicated by the short-time rating, and the endurance indicated by the continuous rating, it will be possible to use smaller sized apparatus for many purposes where continuous rated machines are now used, while still keeping adequate life expectancy.

In closing this discussion, it should be pointed out that a major reason for bringing this matter to the fore at the present time is the more exact knowledge now available of life temperature effects, or aging, of materials. Chemical knowledge, and many tests, indicate that organic insulating materials deteriorate more rapidly at elevated temperatures, in such a way that the life is halved for each 8- to 12-degree-centigrade increase in temperature. On the basis of this law, and knowing the load-temperature characteristics of the apparatus, it is possible to sketch in the entire load-life curve of Figure 1, if the end points, P_m and P, are given. Hence, it is now possible to fit apparatus for intermittent-duty service much more exactly to the requirements than heretofore.

With the increased variety of industry requirements, it is becoming necessary to secure closer thermal co-ordination of all the elements of an electrical system than ever before. The time-current curves for operating, stalled, and short-circuit conditions must be studied for motors, relays, wiring, and power-supply devices, and made consistent with each other. Better knowledge, coupled with more exacting demands, therefore, give a double indication of the need for more precise methods of apparatus rating, as outlined in the AIEE Standards Report No. 1A.

International Sheet Metal Standard Would Help Inter-American Trade

The Preferred Numbers System and the new American Standard for Preferred Thicknesses of Thin Sheet Metal, Mr. Hellmund suggests, offer a basis for international standardization of sheet metal thicknesses

by R. E. Hellmund

Chief Engineer, Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa.

THE American Standards Association has just issued a new standard of far-reaching importance which covers the preferred thicknesses of thin flat metals. The sizes are based on Preferred Numbers. Due to the fortunate circumstance that the conversion ratio[1] between the inch and the metric systems is approximately a Preferred Number, it should be possible to devise an international standard for thin sheet metals which would have practically identical thicknesses for both the metric and the inch system. In countries using the metric system, all that would be necessary would be to use the Preferred Numbers system, which in itself is an approved international standard, as a basis for the standardization of sheet metals.

Although a complete international standardization is of course impossible at this time, it nevertheless seems advisable to take steps in this direction wherever possible, especially in the Latin-American countries. Considerable advantage would be derived from doing this. A number of American concerns are establishing

[1] The American and British Standard inch-millimeter conversion ratio is 25.4.

subsidiaries in Latin America, either independently or in cooperation with Latin-American interests, and such standardization would greatly facilitate the manufacture of American designs in those countries. Most parts made of sheet metal could be manufactured there through the use of local standards of sheet metal. Repair of American products sold in Latin America would also be greatly expedited.

The table on this page shows in the first column the American Standard thicknesses in inches. The second column shows the same thicknesses in millimeters. The third column shows the suggested standard sizes for the metric system based on Preferred Numbers. The fourth column shows the discrepancies between the second and third columns, all of which are very small. For 30 out of 35 sizes the difference is 1.6 per cent or less. Two discrepancies of —4.7 per cent and —3.24 per cent occur in the very thin sheets, and there are three cases of +2.06 per cent for the heavier sheets. The fifth column shows a few tolerances for commercial sheet brass and it will be noted that the discrepancy between the two sizes is only a very small fraction of the commercial tolerances.

American Std Sizes Inches	*American Std Sizes Mm*	*Suggested Std Sizes for Metric System Mm*	*Difference between Col 2 and 3 Per Cent*	*Commercial tolerances of sheet brass and Copper* Per Cent*
.004	.1016	.100	+ 1.6	
.005	.1270	.125	+ 1.6	± 26
.006	.1524	.160	— 4.75	± 21.6
.007	.1778	.180	— 1.22	
.008	.2032	.200	+ 1.60	± 18.3
.009	.2286	.224	+ 2.06	
.01	.2540	.25	+ 1.60	± 18
.011	.2794	.28	— .21	
.012	.3048	.315	— 3.24	
.014	.3556	.360	— 1.11	
.016	.4064	.400	+ 1.60	± 12.5
.018	.4572	.450	+ 1.60	
.020	.5080	.500	+ 1.60	
.022	.5588	.560	— .21	
.025	.6350	.63	+ .79	± 10.
.028	.7112	.71	+ .17	
.032	.8128	.80	+ 1.60	
.036	.9144	.90	+ 1.60	
.040	1.016	1.00	+ 1.60	± 7.5
.045	1.143	1.12	+ 2.06	
.050	1.270	1.25	+ 1.60	
.056	1.422	1.40	+ 1.57	
.063	1.600	1.60	0	
.071	1.803	1.80	+ .17	
.080	2.032	2.00	+ 1.60	
.090	2.286	2.24	+ 2.06	
.100	2.540	2.50	+ 1.60	
.112	2.845	2.80	+ 1.60	
.125	3.175	3.15	+ .79	
.140	3.556	3.60	— 1.11	
.160	4.064	4.00	+ 1.60	
.180	4.572	4.50	+ 1.60	
.200	5.080	5.00	+ 1.60	
.224	5.690	5.60	+ 1.60	
.250	6.350	6.30	+ .79	

* Sheets over 14 in. and up to 20 in. wide. For narrower sheets of the same material tolerances are smaller, but for many other materials such as steel and bronze they are even larger.

New Foreign Standards Received by ASA Library

The following is a list of new and revised standards which have been received recently by the American Standards Association, and which are available to members for loan from the ASA Library.

Argentina

Adopcion del Sistema de Unidades M. K. S. por la Comision Electrotecnica Internacional Publicacion No. 13 1941

Norma CEI para ensayos de conductores aislados can papel impregnado, protegidos con envoltura de plomo, destinados para tensiones de 10 a 66 kV Publication No. 14 1941

Australia

Corrosion-Resistant Utensils for Hospitals Australian Standard Specification, proof issue No. 10, Part 6, Section 7

Great Britain

Screwing Taps, Dimensions, Limits and Tolerances for 949-1941

Open-Hearth Melting Furnaces for the Refining of Steel, Test Code for 979-1941

Mastic Asphalt for Roofing—Type A (Limestone Aggregate) 988-1941

Fuel Fired Melting Furnaces Used in the Non-Ferrous Metal Industry, Test Code for 992-1941

Revised British Standards

Carbon Steel Forgings for Ship and Marine Engine Purposes (Superseding BS29-1909) 29-1941

Round Strand and Flattened Strand Steel Wire Ropes: for Colliery Winding Purposes (Superseding BS 236-1929 and BS 300-1927) 236-1941; for Colliery Haulage Purposes (Superseding BS 237-1929 and BS 330-1929) 330-1941

Cable Glands and Sealing Boxes for Use in Mines (Superseding BS 542-1934) 542-1941

Lead Pipes—B.N.F. Ternary Alloy (No. 2) (Superseding BS 603-1935) 603-1941

British War Emergency Standards

Tins and Cans for Food Products and Tobacco for the Admiralty, the Army, the Royal Air Force and the British Red Cross (Prisoners of War) 956-1941

Gears for Clockwork Mechanisms 978-1941

Combined Drills and Countersinks, Dimensions of 985-1941

Concrete Railway Sleepers 986-1941

Bituminous Roofing Felt (including Classification and Methods of Laying) 989-1941

New Zealand

New Zealand War Emergency Standard

Stretchers for Ambulance Purposes NZSS/E.1

Standard Fire-Hose Connections Are Lacking in Canada

Confusion in sizes and threads of fire-hose connections throughout Canada is greater than had been realized, a survey carried out by the Canadian Engineering Standards Association showed recently. Only in the Province of Quebec has any systematic effort been made to standardize hose connections for fire-fighting equipment, the CESA reports. In this province approximately 90 per cent of municipalities are now on the same basis, half of the cost of standardization having been borne by the Quebec Government and the other half by the municipalities themselves. Throughout the remainder of Canada, however, very little effort has been made toward standardization.

The committee in charge of the survey recommended to the Canadian Engineering Standards Association that the CESA offer its facilities as a co-operative measure to any organization that would be willing to undertake the standardization of threads or other features of fire-fighting equipment.

Public Health Association Presents Housing for Health

Housing for Health, a new publication just issued by the American Public Health Association, presents technical articles on various housing problems, including slum clearance, health facilities in housing projects, recreation and use of living space, control of heating, lighting, and noise, and housing codes. An appendix prepared as a report by the committee on the hygiene of housing of the American Public Health Association outlines "Basic Principals of Healthful Housing." This report has not been approved as a standard publication by the Association's Committee on Research and Standards but has been endorsed by the committee for release so that it may be available for study. Although these recommendations do not at present represent official recommendations of the American Public Health Association, this report may later serve as the basis for customarily accepted standards on hygiene in housing.

Copies are available at $1.00 each from the Committee on the Hygiene of Housing, 310 Cedar Street, New Haven, Connecticut.

Standards Issued by Associations and Government

(See "ASA Standards Activities", page 51, for new American Standards and progress on ASA projects)

Since the publication of the January issue of INDUSTRIAL STANDARDIZATION, the ASA Library has received for its classified files copies of standards and specifications from the organizations listed below.

These standards may be consulted by ASA Members at the ASA Library.

Anyone desiring copies for his own use should write direct to the organization issuing the standard.

Associations and Technical Societies

American Society of Mechanical Engineers (29 West 39th Street, New York, N. Y.)

Boilers, Miniature, Rules for Construction of ASME Code, 1940 ed with 1941 addenda 65¢

Boilers, Power, Rules for Construction of, ASME Code 1940 ed with 1941 addenda $2.25

Metals, ASME Manual on Cutting of 1939 $5.00

Power Test Codes, ASME
- Atmospheric Water-Cooling Equipment 1929 40¢
- Centrifugal Compressors and Exhausters 1935 95¢
- Displacement Compressors, Vacuum Pumps, and Blowers 1939 75¢
- Evaporating Apparatus 1941 50¢
- Feedwater Heaters 1926 35¢
- Flow Measurement 1940 $2.75
- Gas Producers 1923 55¢
- Hydraulic Prime Movers 1938 60¢
- Internal-Combustion Engines 1929 55¢
- Liquid Fuels 1929 35¢
- Reciprocating Steam-Driven Displacement Pumps 1926 65¢
- Reciprocating Steam Engines 1935 65¢
- Refrigerating Systems 1926 50¢
- Solid Fuels 1929 55¢
- Speed-Responsive Governors 1923 45¢
- Stationary Steam-Generating Units 1936 60¢
- Steam-Condensing Apparatus 1938 65¢
- Steam Locomotives 1941 55¢
- Steam Turbines 1941 $2.50

Theoretical Steam Rate Tables 1938 $1.25

Unfired Pressure Vessels for Petroleum Liquids and Gases API-ASME Code 1938 $1.25

American Society for Testing Materials (260 S. Broad Street, Philadelphia, Pa.)

Copper and Copper Alloys, ASTM Standards December 1941 $2.00

Mineral Aggregates, ASTM Standards December 1941 $1.25

Rubber Products, ASTM Standards December 1941 $1.75

Book Manufacturers' Institute, Inc. (25 West 43rd Street, New York, N. Y.)

Textbooks, Minimum Manufacturing Standards and Specifications 1939

Copper and Brass Research Association (420 Lexington Avenue, New York, N. Y.)

Definitions and Scope Term.-2 to Term.-8 incl December 1941

Weight Tables for Seamless Tubes Data-47 to -67 incl December 1941

Tire and Rim Association, Inc. (Main and Exchange Streets, Akron, Ohio)

1942 Year Book (Includes TRA Standards, Recommended Practices and Experimental Practices for Tire and Rim Manufacture)

Society of Automotive Engineers, Inc. (29 West 39th Street, New York, N. Y.)

Aircraft-Engine Standards October 1941
- Carburetor Installations—10 stds
- Engine Accessory Drives—3 stds
- Magnetos—4 stds
- Standard Parts—11 stds
- Preservation of Engines—6 stds
- Engine Performance Presentation—7 stds

Aircraft Engine Drafting Room Practice, Manual of $1.50

Aeronautical Material Specifications November 1941 Includes: Processes; Non-Metallics; Aluminum Alloys; Magnesium Alloys; Copper Alloys; Carbon Steels; Corrosion Resistant Steels; Low Alloy Steels; Accessories, Fabricated Parts and Assemblies

Complete set of 41 Aircraft-Engine Standards (unbound) $1.20; 164 Material Specifications (unbound) $3.40; per sheet 5¢ (minimum charge 25¢)

United States Government

National Bureau of Standards (Washington, D. C.)

Commercial Standards

Approved by the Standing Committee and Circulated to Industry

Clinical Thermometers CS1-32 Recommended Revision

Cotton for Hospitals TS-3172 Recommended Commercial Standard

Gas Floor Furnaces TS-3162 Recommended Commercial Standard

Accepted by Industry and Promulgated

Electric Supplementary Driving and Passing Lamps for Vehicles (After Market) CS97-42

Simplified Practice Recommendations

Approved by Standing Committee and Circulated to Industry

Asphalt-Prepared Roofing and Siding

Unbleached Cotton Canton Flannel

Accepted by Industry and Promulgated

Corrugated and Solid Fiber Boxes for Canned Fruits and Vegetables (Revision of R146-38)

Eaves Trough, Conductor Pipe, Fittings, and Ridge Rolls (Revision of R29-39)

Forged Axes (Revision of R158-37)

Pipe Fittings R185-42

Roofing Ternes R30-42

Valves: Brass or Bronze R183-42; Iron Body R184-42

In Print (Copies available from Superintendent of Documents, Government Printing Office, Washington, D. C.)

Forged Hatchets (supersedes R160-37) R160-41 November 1, 1941

Federal Specifications Executive Committee (U. S. Treasury Department, Washington, D. C.)

Federal Specifications

(Copies available from Superintendent of Documents, Government Printing Office, Washington, D. C.)

The date after the title of the specification indicates when the specification becomes effective.

Aluminum-Alloy (Aluminum-Manganese): bars, rods, shapes and wire (Amendment 1) QQ-A-356a March 1, 1942

Apple Butter (Superseding Z-A-616) Z-A-616a March 1, 1942

Apples: fresh (Superseding Y-A-606) Y-A-606a February 2, 1942

Applesauce; canned (Superseding Z-A-621) Z-A-621a February 2, 1942

Barrels; steel, type 5 (Superseding RR-B-116) RR-B-116a February 1, 1942

Beans, Lima; canned (Superseding JJJ-B-126a) JJJ-B-126b February 2, 1942

Federal Specifications (continued)

Beans, Snap; canned (Superseding JJJ-B-151) JJJ-B-151a February 2, 1942

Bearings; ball (new) FF-B-171 March 1, 1942

Bearings; roller (new) FF-B-186 February 2, 1942

Beds, Hospital; adjustable-spring-bottom (Amendment 1) AA-B-211b February 2, 1942

Bottles; prescription (Superseding DD-B-591) DD-B-591a March 1, 1942

Bowls, Sponge; corrosion-resisting-steel (Amendment 1) RR-B-616 Feb 2, 1942

Brass, Commercial; bars, plates, rods, shapes, sheets, and strips (Amendment 1) QQ-B-611a Feb 2, 1942

Bronze, Aluminum; bars, plates, rods, shapes, sheets, and strips (Amendment 2) QQ-B-666 March 15, 1942

Brooms; rattan, push (Amendment 5) H-B-71 March 15, 1942

Brushes; sweeping, floor, hair (Amendment 2) H-B-651 Feb 2, 1942

Brushes, Varnish; flat (new) H-B-696 Feb 2, 1942

Cans, Milk; steel, tinned (new) RR-C-83 Feb 2, 1942

Cheese; American (Cheddar or American-Cheddar) and Process American (Amendment 4) C-C-271a Feb 2, 1942

Cheese; Swiss (domestic and process) (Amendment 1) C-C-301a Feb 2, 1942

Cherries; canned (Superseding Z-C-301) Z-C-301a Feb 2, 1942

Clocks; synchronous-motor, (for) general purposes (Amendment 2) GG-C-466 Feb 2, 1942

Coats and Trousers; rubber-coated (foul-weather-clothing) (new) BBB-C-606 Feb 2, 1942

Conduit; steel, flexible (new) WW-C-566 Feb 15, 1942

Cork; compressed (corkboard) (for thermal insulation) (Superseding HH-C-561a) HH-C-561b Feb 2, 1942

Cucumbers; slicing, fresh (Superseding HHH-C-751) HHH-C-751a Feb 2, 1942

Filler; wood, paste (Superseding TT-F-336) TT-F-336a March 1, 1942

Flashlights; electric, hand (without batteries) (Amendment 1) W-F-421a March 15, 1942

Fruit-Cocktail; canned (new) Z-F-681 Feb 2, 1942

Gauze; plain (Amendment 2) CCC-G-101a March 1, 1942

Glasses, Cover; (for) microscopy (new) DD-G-426 Jan 2, 1942

Hominy-Grits (Amendment 3) N-H-521 Feb 2, 1942

Hose:

- chemical (Amendment 1) ZZ-H-421a March 15, 1942
- gasoline, wire-stiffened (Amendment 2) ZZ-H-471 March 15, 1942
- oil-suction and discharge (Amendment 1) ZZ-H-481b March 15, 1942
- pneumatic, braided (Amendment 1) ZZ-H-496 March 15, 1942
- pneumatic, wrapped (Amendment 4) ZZ-H-499 March 15, 1942

Hose (Continued)

spray (Amendment 3) ZZ-H-521 March 15, 1942

steam (Amendment 1) ZZ-H-541 March 15, 1942

suction, water, smooth-bore (Amendment 1) ZZ-H-561b March 15, 1942

water, wrapped (Amendment 3) ZZ-H-611 March 15, 1942

Jellies; fruit (Superseding Z-J-191) Z-J-191a March 1, 1942

Lanterns; oil-burning, hand, globe (new) RR-L-112 March 1, 1942

Leather; harness, black and russet (vegetable-tanned) (Superseding KK-L-171) KK-L-171a Feb 2, 1942

Lemons; fresh (Superseding Y-L-231) Y-L-231a Feb 15, 1942

Linings; brake (automotive-use) (Superseding HH-L-361) HH-L-361a March 1, 1942

Mats, Floor; rubber, link-type (Amendment 1) ZZ-M-46 Feb 2, 1942

Motor Fuel V (Superseding VV-M-571a) VV-M-571b March 15, 1942

Onions (Amendment 1) HHH-O-531 Feb 2, 1942

Oranges; fresh (California and Arizona) (Superseding part of Y-O-661) Y-O-660 Feb 15, 1942

Paint; iron-oxide, ready-mixed and semi-paste, red and brown (Superseding TT-P-31) TT-P-31a March 1, 1942

Panelboards; equipped with automatic circuit-breakers (Superseding W-P-131) W-P-131a March 15, 1942

Peaches; fresh (Superseding Y-P-151) Y-P-151a Feb 15, 1942

Pipe-Fittings; brass or bronze (threaded or brazed), 125 pound (Superseding WW-P-448) WW-P-448a Feb 2, 1942

Potatoes; Irish (Amendment 1) HHH-P-611 Feb 2, 1942

Radioactive-Luminous-Compound and Adhesives (Amendment 1) TT-R-58 March 1, 1942

Ribbons; computing and recording-machine (Amendment 2) DDD-R-271 Feb 2, 1942 (extension of Feb 2, 1941)

Ribbons; hectograph (Amendment 2) DDD-R-291 Feb 2, 1942

Salmon; canned (Superseding PP-S-31) PP-S-31a Feb 2, 1942

Sauerkraut; canned (Superseding JJJ-S-71) JJJ-S-71a Feb 2, 1942

Scissors and Shears (Superseding GGG-S-101a) GGG-S-101b Feb 2, 1942

Sealer, Floor; varnish-type (for wood and cork) (Superseding TT-S-176) TT-S-176a March 1, 1942

Shrimp; canned (Amendment 3) PP-S-311 March 1, 1942

Soap, Liquid and Paste; (for) automobile floor and general cleaning (Superseding P-S-612) P-S-598 March 1, 1942

Soap, Potash-Linseed-Oil; liquid and paste, (for) floor and general cleaning (Superseding P-S-613) P-S-603 March 1, 1942

Spices; ground and whole (Amendment 2) EE-S-631a Feb 2, 1942

Spinach; canned (Superseding JJJ-S-611) JJJ-S-611a Feb 2, 1942

Squares, Carpenters', Die-Makers', and Machinists' (new) GGG-S-656 Feb 1, 1942

Tableware; steel (chromium, nickel, silver, and tin)-plated (new) RR-T-56 Feb 2, 1942

Tires, Pneumatic; automobile and motorcycle (Superseding ZZ-T-381c) ZZ-T-381d Feb 2, 1942

Tubes, Automobile and Motorcycle; inner (Superseding ZZ-T-721b) ZZ-T-721c Feb 2, 1942

Tubing; rubber (Superseding ZZ-T-831a) ZZ-T-831b Feb 2, 1942

Urinals; male, glass, graduated (Superseding DD-U-686) DD-U-686a March 1, 1942

Emergency Alternate Federal Specifications

Brushes; scrubbing, deck E-H-B-531

Buckets; metal, galvanized E-RR-B-771a

Burlap; jute E-CCC-B-811

Cable and Wire; rubber-insulated, building-type (0 to 5,000-volt service) E-J-C-103

Candles E-C-C-91

Couplings: hose, cotton (rubber-lined) and linen (unlined) E-WW-C-621a; hose, water-suction E-WW-C-646

Desks; steel E-AA-D-191

Felt; asphalt-saturated, (for) flashings, roofing, and waterproofing E-HH-F-191

Hose, Fire; cotton, rubber-lined E-ZZ-H-451a

Iron, Malleable; castings E-QQ-I-666

Laundry Appliances (Superseding E-OO-L-131b, dated Aug 27, 1941) E-OO-L-131b

Machines; slicing, meat E-OO-M-81

Oil: linseed, boiled E-JJJ-O-331; linseed, raw E-JJJ-O-336

Panelboards; equipped with automatic circuit-breakers (Superseding E-W-P-131, dated May 23, 1941) E-W-P-131a

Pigments and Paint—

Bone-Black; dry, paste-in-japan, paste-in-oil E-TT-B-601

Indian-Red; dry, paste-in-japan, paste-in-oil E-TT-I-511

Lampblack; dry, paste-in-japan, paste-in-oil E-TT-L-71

Ocher; dry, paste-in-japan, paste-in-oil E-TT-O-111

Paint; iron-oxide, ready-mixed and semipaste, red and brown E-TT-P-31a; ready-mixed and semipaste, black E-TT-P-61; ready-mixed and semipaste, olive-drab E-TT-P-81

Receptacles; waste-paper, metal, office and lobby E-RR-R-191

Ribbons; typewriter E-DDD-R-311a

Wire; brass E-QQ-W-321

NCRC Adopts Standards For Judging Textile Labels

A standard practice for judging textile labels has been adopted by the National Consumer-Retailer Council. These rules are expected to be a help to the Textile Label Approval Committee, which faces a difficult task due to the lack of recognized standards in the textile field.

Light Gray for Machine Tools Proposed as National Standard

A lighter color gray than the shade formerly used on machine tools has been submitted to the American Standards Association for adoption as an American Standard by the National Machine Tool Builder's Association. The color, known as "Standard Machine Tool Gray" and as "7-B", has been adopted by the NMTBA as an association standard.

Many large users have been specifying lighter colors for their machine tool purchases, and there is a definite trend toward lighter color for this purpose, the NMTBA explains.

This trend has been emphasized through the results of research carried out by the Frigidaire Division of General Motors Corporation, which indicate that improvement in light reflection resulting from the use of the lighter color on machine tools not only would improve visibility on the machines with consequent greater ease of operation and accuracy of results, but would also make possible a decided saving in the amount of light necessary in a department where these machines are installed. The research has resulted in acceptance of this color as the standard for all General Motors Divisions.

The Association believes that for the sake of uniformity in metal-working plants the same color should be adopted as standard for other types of metal-working and manufacturing equipment, and for this reason it is submitting the color to the ASA for approval as an American Standard.

AREA Committee Recommends ASA Approval on Scale Standards

Committee 26 on Standardization of the American Railway Engineering Association, in a recent report (Bulletin 427, November, 1941) recommended several AREA recommended practices as suitable for national standardization through the American Standards Association. Two of these, proposed by Committee 14 on Yards and Terminals, cover Specifications for the Manufacture and Installation of Four-Section, Knife Edge, Railway Track Scales, and Specifications for the Manufacture and Installation of Two-Section, Knife Edge, Railway Track Scales.

These specifications were originally prepared by a committee representing the Association of American Railroads, the American Railway Engineering Association, National Bureau of Standards, the Railroad and Warehouse Commission of Minnesota, the National Scale Men's Association and the Scale Manufacturers Association. Although these specifications were considered to be suitable subjects for national standardization as far back as 1935, it was decided by Committee 14 that they needed a complete overhauling before being submitted to the American Standards Association. The revised standards have now been completed, approved by the National Bureau of Standards which carried out the tests in connection with the revisions, and the standards are now being considered by the AREA for submittal to the ASA.

Price Ceilings on Stoves Tied to Quality Standards

The principle that price ceilings are useless unless coupled with quality standards, enunciated from time to time by the OPA Consumer Division, was accepted for the first time in connection with a price control order in the case of domestic cooking and heating stoves. The order sets a ceiling of 112 per cent of the lowest price between January 15, and June 1, 1941 for unaltered models of domestic stoves. For new models, however, the ceiling will not be set until detailed specifications have been examined. An indication of what result may be expected is given in the requirement that quotations must be scaled down on stoves whose "table tops" have been removed in compliance with an OPM order.

The Consumer Division holds that unless price ceilings are coupled with the use of quality standards a manufacturer can cheapen his merchandise and thus in effect increase his prices and, from the consumer point of view, nullify the effectiveness of price regulation.

Regular Safety Inspection Starts in Coal Mines

Acting under a new law, the Government has begun regular safety inspection of mines for the first time, Dr. R. R. Sayers, Director of the Bureau of Mines, reported January 3. The work is designed not only to cut down the number of coal mine deaths, which were 1,300 in 1940, but also to help mobilize natural resources for the war emergency.

More than 100 Federal inspectors have taken courses of training and are now active in the coal fields.

The Bureau's announcement declared that injuries to 59,781 miners in 1940 deprived defense and industrial plants of a potential 10,300,000 tons of coal in that year. Each of the more than 59,000 miners injured lost an average of 39 working days, or a total of 2,321,459 days.

ASA Emergency Committee Considers Machine Tool Electrical Standards

An emergency technical committee has been set up by the American Standards Association to consider several suggestions for modifications in the Machine Tool Electrical Standards recently submitted to the American Standards Association by the National Machine Tool Builders' Association. The standards are being considered for approval as American Defense Emergency Standards.

The emergency committee is made up of six representatives of the National Machine Tool Builders' Association, four representatives of the National Electrical Manufacturers Association, one representative of the ASA Electric Light and Power Group, the chairman of the ASA Committee on the National Electrical Code, the chairmen of the subcommittees of the committee on Motor Control and on Machine Tool Electrical Wiring, the chairman of the ASA Committee on Rotating Electrical Machinery, and the chairman of the ASA subcommittee on Electric Control Symbols.

At a meeting January 16, this committee agreed upon certain changes in the standards, which are now being incorporated in the document. As soon as copies are completed, a canvass of key individuals concerned will be taken, and if the standards are found to be acceptable the ASA will approve them as American Defense Emergency Standards.

Canada Starts Standards For Pole Line Hardware

Standardization of pole line hardware would be of considerable advantage in Canada, the Canadian Engineering Standards Association reported recently, in authorizing a new project on the subject. Very little attempt has been made to standardize dimensions, the CESA reports, with the result that line men are required to carry spanners of different sizes in order to accomodate the variations in sizes of bolts, nuts, and other items used in the construction of communication or power lines. Some of the items for which standards were suggested include: crossarm bolts; eyebolts and eye nuts; guy rods and guy clamps; carriage bolts; machine bolts; suspension clamps or messenger hangers; wood top and steel top pins.

The CESA committee which is being organized to carry out the new project is expected to cooperate with the Canadian Electrical Association which has already done some work on the subject.

AAR Recommends Limitation On Freight-Car Designs

Thirteen designs of freight cars have been recommended by the Car Construction Committee of the Association of American Railroads' Mechanical Division as a basis for a simplified practice program recommended by the AAR to its member roads. The 13 designs, to which the member roads are being asked to restrict their future orders, comprise three box cars, one auto-box car, two hopper cars, four gondola cars, and three flat cars. In his letter recommending the simplification program, J. J. Pelley, AAR president, declares that by thus restricting the number of designs of new equipment, OPM expects to increase the capacity of car-building facilities and simplify the material supply problems. "As the matter now stands," Mr. Pelley said, "procurement of material for new freight cars is contingent on acceptance by the railroads of some program of simplified practice and a firm commitment to that effect to the OPM."

Of the 13 recommended designs, those for the four box cars and the two hopper cars conform to AAR standard designs. No AAR standard designs for gondola cars or flat cars have been developed.

Standards Coordinate Production On "Flying Fortresses"

The place of standardization in production for victory is indicated in a news story published recently to the effect that freight trains running on passenger schedules are hauling prefabricated assemblies to Southern California for "flying fortresses" and attack bombers. Whole sections of airplanes are being shuttled to the assembly plants, the story declared, with more than a dozen companies co-operating in making landing gears, pedals, cowlings, fuel tanks and wings. Only standardization, with resulting interchangeability of parts, makes such coordination of production possible.

ASA Standards Activities

Approved Standard Available Since Publication of Our January Issue

Graphical Symbols for Use on Drawings in Mechanical Engineering (Revision of Z14.2-1935) American Standard Z32.2-1941 50¢

Standards Approved Since Our January Issue

Air Gaps in Plumbing Systems American Standard A40.4-1942

Concrete Masonry Units for Construction of Catch Basins and Manholes (ASTM C139-39) American Standard A73.1-1942

Carbon-Steel Castings for Valves, Flanges, and Fittings for High-Temperature Service (ASTM A95.40) (Revision of G17.1-1940) American Standard G17.1-1942

Rubber Products, Methods of Sample Preparation for Physical Testing of (ASTM D15-41) American Standard J1.1-1942

Vulcanized Rubber:

Methods of Tension Testing of (ASTM D412-41) American Standard J2.1-1942

Methods of Test for Adhesion of (Friction Test) (ASTM D413-39) American Standard J3.1-1942

Methods of Test for Accelerated Aging of, by Oxygen-Pressure Method (ASTM D572-41) American Standard J4.1-1942

Methods of Test for Accelerated Aging of, by Oven Method (ASTM D573-41) American Standard J5.1-1942

Tubular Sleeving and Braids, Methods of Testing and Tolerances (ASTM D354-36) (Revision of L13-1941) American Standard L13-1942

Drinking Fountains (Revision of Z4.2-1935) American Standard Z4.2-1942

Letter Symbols for Hydraulics (Revision of Z10b-1929) American Standard Z10.2-1942

Letter Symbols for Mechanics of Solid Bodies (Revision of Z10a-1932) American Standard Z10.3-1942

Standards Being Considered for ASA Approval

Keyways for Holes in Gears B6.4

Cast-Iron Pipe Flanges and Flanged Fittings, Class 250 (Revision of B16b-1928)

Safety Code for Jacks B30

Protection of Structures Containing Inflammable Liquids and Gases—Part 3 of Code for Protection Against Lightning (From status as American Tentative Standard to American Standard) C5, Part 3

Rubber Gloves for Electrical Workers (ASTM D120-40) C59.12

Use of Explosives in Anthracite Mines, Proposed American Recommended Practice M27

Public Approval and Certification Procedures Z34

Cast-Iron Screwed Drainage Fittings B16.12

Type SB (Slow Burning) Wire and Cable (Revision of C8K2-1932) C8.9

Impregnated Paper Insulation of Solid Type for Lead Covered Power Cable (Revision of C8.10-1938) C8.10

Cotton Braid for Insulated Wire and Cable for General Purposes (Revision of C8.12-1935) C8.12

Varnished Cloth Insulation for Lead Covered or Braid Covered Power Cable (Revision of C8.13-1937) C8.13

Metallic Coverings for Insulated Wire and Cable (Revision of C8.15-1938) C8.15

Rotating Electrical Machinery on Railway Locomotives and Rail Cars and Trolley, Gasoline-Electric and Oil-Electric Coaches (Revision of C35-1936) C35

Illuminating Engineering Nomenclature and Photometric Standards (Revision of Z7-1932)

Quicklime for Structural Purposes, Specifications for (ASTM C5-26)

Limestone, Quicklime, and Hydrated Lime, Methods of Chemical Analysis of (ASTM C25-29)

Structural Clay Load-Bearing Wall Tile (ASTM C34-41)

Concrete Building Brick (ASTM C55-37)

Structural Clay Non-Load-Bearing Tile (ASTM C56-41)

Structural Clay Floor Tile (ASTM C57-39)

Sand-Lime Building Brick (ASTM C73-39)

Hollow Load-Bearing Concrete Masonry Units (ASTM C90-39)

Hollow Non-Load-Bearing Concrete Masonry Units (ASTM C129-39)

Solid Load-Bearing Concrete Masonry Units (ASTM C145-40)

Brick (Modulus of Rupture, Compressive Strength, Absorption, Freezing, and Thawing), Methods of Testing (ASTM C67-41)

Structural Clay Tile, Methods of Testing (ASTM C112-36)

Concrete Masonry Units (ASTM C140-39)

Adjustable Face Traffic Control Signal Head Standards

Elevators, Safety Code for (Supplement to 1937 ed)

Industrial Lighting

Standard Machine Tool Gray "7-B"

Structural Steel, Building Code Requirements for

Textile Testing Machines (ASTM D76-41)

Wool Felt, Methods of Testing (ASTM D461-40)

Withdrawal of Approval Being Considered

Weatherproof Wire and Cable C8.8 (C8k1-1932)

Defense Emergency Standards

Standards Under Way

Automatic Refrigerators B38

Allowable Concentration of Acetone Z37

Allowable Concentration of Azides, Lead and Sodium Z37

Allowable Concentration of Ether Z37

Allowable Concentration of Manganese Z37

Allowable Concentration of Tetryl Z37

Allowable Concentration of TNT Z37

Allowable Concentration of Xylol Z37

Domestic Washing Machines

Definitions of Denim and Broadcloth

Machine Tool Electrical Standards

Electric Flat-irons C70

Protective Lighting of Industrial Plants

Requests for Projects Being Considered

Definitions of Percale Sheets

Photographic Exposure Guides

For MEMBERS of

The American Standards Association

- With this issue of INDUSTRIAL STANDARDIZATION goes the new list of American Standards.
- It includes nearly 500 American Standards in a wide variety of engineering fields, in the fields of industrial and public safety, and in the field of industrial hygiene. New standards, approved since the last edition of the list, are starred.
- The standards listed here are used widely—by industry, by municipal, state, and federal governments.
- This list is a tool that should be on every engineer's desk. Send for additional copies for other men in your organization who do not receive the magazine.
- See what standards apply to YOUR product or to YOUR operating practices.

American Standards Association

29 West 39 Street New York

Let your competitor make the non-standard product!